

DEPARTMENT OF ENVIRONMENTAL QUALITY  
REMEDIATION DIVISION

## **Technical Guidance Document #11**

### **Filtering or Decanting Samples Prior to Laboratory Analysis**

In cases where well development and groundwater sampling procedures do not generate turbidity free samples, requests have been received by Department of Environmental Quality (DEQ) to filter or decant the samples prior to laboratory analysis for petroleum hydrocarbons. The DEQ does not approve of filtration or decanting of water samples collected at petroleum release sites

Environmental Protection Agency (EPA) guidance documents advise against filtering organic compound samples because the increased handling may result in the loss of chemical constituents of interest (EPA, 1991). If filtering is applied to a sample, a method of determining the recovery of the chemical constituents of interest would be to collect split samples and spikes both samples with a standard. One sample should be filtered and one should remain unfiltered. The filtered and unfiltered samples should be analyzed and the surrogate standards should be used to determine recovery of the chemical constituents of interest (Barcelona et al., 1985). This option of sample analysis will more than double the analytical costs for groundwater monitoring.

Because the purpose of sampling includes quantifying mobile contaminant species, unfiltered samples should be collected. Contaminants travel not only in a dissolved phase, but may also be sorbed to mobile colloidal particles. The colloids generally have a diameter less than 10 microns, which means there is a high probability that the colloids will be removed during the filtering process (Puls and Barcelona, 1989). Common filter sizes range from 0.45 microns to 0.1 microns, which will remove a majority of the colloids present in the groundwater (Puls and Barcelona, 1989)

Allowing any fine material to settle prior to analysis, followed by decanting the sample has also been proposed. The increased handling of the sample, transferring the sample water from a bailer to a sample bottle then from that sample bottle to another sample bottle, could result in the loss of volatile chemical constituents. Instead, an analysis should be performed to determine why a particular monitoring well is producing turbid samples. For example, if the well was originally developed by bailing, the well is also being developed during purging and sampling activities, and will yield turbid samples. In addition, if samples collected using a bailer are turbid, alternate purging and sampling methods should be evaluated.

EPA references cited below conclude that sample filtration and sample decanting should not be used to compensate for inadequate well construction, well development, or sampling procedures. DEQ concurs with this conclusion. Modification of sampling procedures, such as using low-flow purging and sampling techniques should be performed at petroleum release sites where turbid samples are generated. Alternately, additional well development, using a surging technique combined with a higher pumping rate than that used for routine purging and sampling may prove effective. Either or both of these solutions address the source of turbid samples, and both are

preferable to an approach relying on increased sample handling. Accordingly, the DEQ does not approve of filtration or decanting of water samples collected at petroleum release sites.

## References

EPA. 1991. Handbook, Groundwater Volume II: Methodology. Office of Research and Development, Washington, D.C.

Barcelona, M.J., Gibb, J.P., Helfroch, J.A., Garske, E.E. 1991. Practical Guide for Groundwater Sampling. Illinois State Water Survey, Champaign, Illinois.

Puls, R.W., Barcelona, M.J., 1989. Groundwater Sampling for Metals Analyses. Superfund Groundwater Issue, March 1989.